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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/830,478	06/29/2001	Christian Speth	P/3781-4	8170
24998	7590	09/08/2003	EXAMINER	
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP			LANGEL, WAYNE A	
2101 L STREET NW			ART UNIT	
WASHINGTON, DC 20037-1526			PAPER NUMBER	

1754

DATE MAILED: 09/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

830478

Applicant(s)

Speth

Examiner

Langel

Group Art Unit

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— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- ☐ Responsive to communication(s) filed on \_\_\_\_\_
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- ☒ Claim(s) 1-10 is/are pending in the application.
- ☐ Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 1-10 is/are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement

## Application Papers

- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

- ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☒ All ☐ Some ☐ None of the:

- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_

- ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 4 and 6 ☐ Interview Summary, PTO-413
- ☒ Notice of Reference(s) Cited, PTO-892 ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948 ☐ Other \_\_\_\_\_

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 6 and 7 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Murayama et al. Murayama et al. disclose a catalyst layer-fixed reactor for an exothermic reaction which comprises a plurality of reaction tubes disposed within a shell of the reactor, an inner tube disposed in the middle portion of each of the reaction tubes, catalyst layers formed by catalyst charged in the space inside the reaction tubes and outside the inner tubes, and a cooling medium charged between each of the reaction tubes in the shell, and in which a feed gas is flowed in each of the

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inner tubes in co-current to feed gas flowing in the fixed catalyst layer. (See the Abstract.) Murayama et al. disclose at column 4, lines 21-26 that molten salts may be used as the cooling medium in the catalyst layer-fixed reactor, and further teach at column 1, lines 8-13 that the reactor may be used to synthesize ammonia from a feed gas containing hydrogen and nitrogen. Accordingly Murayama et al. disclose all the limitations recited in applicant's claims 1, 6 and 7. In any event, it would be prima facie obvious to simultaneously employ the reactor of Murayama et al. for ammonia synthesis and to employ molten salts as the cooling medium in the catalyst layer-fixed reactor, since Murayama et al. suggest the same at the aforementioned passages.

Claim 8 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Murayama et al. Murayama et al. is relied upon as discussed hereinbefore. It would be prima facie obvious to employ a wall of the cooling tube having a lower mechanical strength than the wall of the catalyst tube in the reactor of Murayama et al., since it would be within the skill of one of ordinary skill in the art to determine suitable requirements for the mechanical strength of the cooling tube and the catalyst tube in such reactor.

Claims 2, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murayama et al. as applied to claim 1

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above, and further in view of Lee. It would be further obvious from Lee to carry out the process of Murayama et al. in two or more reaction zones with intermediate withdrawal of an ammonia rich effluent stream between the reaction zones, since Lee discloses such an arrangement in the Figure of the drawing, and the description thereof from column 4, line 14 - column 6, line 50.

Claims 3, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murayama et al. as applied to claim 1 above, and further in view of either Pinto or Porter. It would be further obvious from either Pinto or Porter to separate the ammonia rich effluent stream formed in the process of Murayama et al. into a stream of unconverted ammonia synthesis gas and an ammonia product stream, and recycling the unconverted ammonia synthesis gas to the reaction zone, since Pinto and Porter both disclose such conventional expedients. (See the Abstract of Pinto and lines 50-78 on page 1 of Porter.)

Claims 3, 9 and 10 are rejected under 35 U.S.C. § 112 second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 3, the recitation of "separated in a stream" is indefinite. The word "in" should be changed to --into-- to avoid this rejection.

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Zardi et al. is made of record for disclosing an ammonia synthesis process in which the synthesis gas is reacted in several catalytic beds, and the reaction gas is collected at the outlet from the last catalytic bed but one.

Grotz is made of record for disclosing an ammonia synthesis process in which a synthesis gas mixture containing nitrogen and hydrogen is passed sequentially over two or more catalyst beds containing ammonia synthesis catalyst to produce a gaseous effluent from each of the catalyst beds containing ammonia and unreacted nitrogen and hydrogen.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wayne A. Langel whose telephone number is (703) 308-0248. The examiner can normally be reached on Monday through Friday from 8 A.M. to 3:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on (703) 308-3837. The fax phone number for this Group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-2351.

WAL:cdc  
September 3, 2003

*Wayne A. Langel*  
WAYNE A. LANGEL  
PRIMARY EXAMINER